



**US Army Corps
of Engineers**
Jacksonville District

Superfund Five-Year Review Report

Pickettville Road Landfill Jacksonville, Duval County, Florida

Prepared for
U.S. Environmental Protection Agency, Region IV
September 1999

EPA Five-Year Review Signature Cover

Preliminary Information

Site name: Pickettville Road Landfill		EPA ID: FLD980556351
Region: 04	State: Florida	City/County: Duval County
LTRA* (highlight): Y N		Construction completion date: 1/7/97
Fund/PRP Lead: PRP		NPL status: Final
Lead agency: EPA, Region 4		
Who conducted the review (EPA Region, state, Federal agencies or contractor): US Army Corps of Engineers, Jacksonville District		
Dates review conducted: From 6/1/99 To: 9/30/99		Date(s) of site visit: 6/30/99
Whether first or successive review: First Review		
Circle: Statutory Policy	Due date: 2/7/99	
Trigger for this review (name and date): Initiation of RA Activities		
Recycling, reuse, redevelopment site (highlight): Y N		

Deficiencies:

A list of deficiencies were identified. See attached report Section VII: Deficiencies.

Recommendations:

Recommendations are listed in the attached report, Section VIII: Recommendations.

Protectiveness Statement(s):

The remedies at the Pickettville Road Landfill Site remain protective of human health and the environment, at present. However, the areas of contamination identified in the right-of-way of Pickettville Road and the Realco Landfill just north of the PRLS need further evaluation in order to ensure long-term protectiveness.

Other Comments:

The deficiencies noted during this review are not immediate threats to the protectiveness of the remedy. Once these items are investigated and corrected, long-term protectiveness, operation, and site safety will be improved.

Signature of EPA Regional Administrator or Division Director, and Date

Signature

Date

Name and Title

**Pickettville Road Landfill
Jacksonville, Duval County, Florida
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**Pickettville Road Landfill
Jacksonville, Duval County, Florida
Superfund Five-Year Review Report**

I. Introduction and Purpose

General. The U.S. Army Corps of Engineers, Jacksonville District (USACE), on behalf of the U.S. Environmental Protection Agency, Region 4 (EPA), has conducted a five-year review of the remedial actions implemented at Pickettville Road Landfill Site (PRLS) in Jacksonville, Duval County, Florida. This report documents the results of that review. The purpose of five-year reviews is to determine whether the remedial actions at a site remain protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify deficiencies found during the review, if any, and recommendations to address them.

Authority. This review is required by statute. Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and Section 300.430 (f) (4) (ii) of the National Oil and Hazardous Substance Contingency Plan (NCP), require that periodic (no less than every five years) reviews be conducted for sites where hazardous substances, pollutants or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure following the completion of all remedial actions.

This is the first five-year review for the PRLS. The trigger for this statutory review is the initiation of remedial action (RA) at the site, signified by the actual RA start date shown in EPA's CERCLIS/WasteLAN database. All remedies for Operable Unit 01 (OU-01) and OU-02 have been completed; there are no on-going remedial actions at this site.

Local Repository. This review will be placed in the Site files and local repository for PRLS. The repository is located at the Highlands Branch of the Jacksonville Public Library, 1826 Dunn Avenue, Jacksonville, Florida 32218.

II. Site Background

The following text is borrowed in large part, with modifications and additions, from the EPA Record of Decision (ROD) document and ROD abstract (September 28, 1990), the Remedial Action (RA) Construction Report, with addendum (June 1997), by Golder Associates, Jacksonville Florida, and the Groundwater Monitoring Report, Fourth Quarter 1998 (Golder Associates, March 1999).

A. Site Description

General. The PRLS is a 52 acre inactive municipal landfill located at 5150 Pickettville Road, approximately five miles northwest of downtown Jacksonville in Duval County, Florida. The PRLS is bordered to the north and northwest by Pickettville Road, to the east and southeast by Little Sixmile Creek, and to the west and southwest by rural/residential property. The surrounding area is rural with mixed industrial and residential usage. Adjacent industry is predominantly located to the north and northwest of the Site, and includes the Jacksonville Shipyards Waste Disposal Area, the Westview Cemetery, the Realco Demolition Landfill Facility, and the Logistical Transportation and Petroleum Company. A site location map is presented as Figure 1.

Physical Characteristics of the Landfill System. The landfill cover system was completed in January 1997, leading to final closure of the Pickettville Road Landfill in February 1997. The surface topography of the landfill cover system slopes downward toward the perimeter at about 3 to 4 percent in all directions from two high points in the landfill- the center of the main portion and the center of the panhandle portion. Surface elevations range from approximately 33 feet above National Geodetic Vertical Datum (NGVD) in the center of the landfill to approximately 25 to 15 feet above NGVD in the perimeter ditches and approximately 9 to 10 feet above NGVD in the on-site surface water ponds. On-site surface water ponds include Pond #1, located in the northeast corner of the site, and Pond #2 which extends along the east and southeast boundary of the site near Little Sixmile Creek. A general layout map, which shows landfill system features, is presented as Figure 2.

Surface Waters. There are two primary surface water bodies near the PRLS: Little Sixmile Creek, which flows northeasterly along the eastern PRLS property line, and Sixmile Creek, which is located approximately 1000 feet north of the PRLS, flowing from west to east. Surface water runoff at the PRLS generally flows in a east-southeast direction and discharges into Little Sixmile Creek, which in turn discharges into Sixmile Creek approximately 700 feet downstream of Pickettville Road. No waste remains exposed to surface water as a result of the remedial action.

Hydrogeological Units. The hydrogeological units which are present in the vicinity of the PRLS are the Upper Sand Aquifer, the Rock Aquifer, and the Hawthorn Group. The Upper Sand Aquifer ranges in thickness from approximately 40 to 50 feet, and consists of poorly graded, fine to coarse sand with traces of silty clay and fine organic material. Most of the upper sand aquifer unit at the PRLS; was likely mined out to depths of 50 feet during borrow pit operations from the 1940's through 1960's. The ROD indicated that a discontinuous, silty clay seam was present within the Upper Sand Aquifer at an approximate depth of 20 feet below ground surface (bgs). Where present beneath the PRLS, this clay layer ranges from several feet to approximately nine feet in thickness. Also present within the Upper Sand Aquifer and immediately underlying the Pickettville Road Right of Way in the northeast portion of the PRLS, is a small, narrow zone which has relatively higher permeability than the surrounding strata, based on data reported in

the Right of Way (ROW) Study Report (Golder Associates, June 1999). This zone of higher permeability varies in thickness, ranging in depth from approximately 22 feet bgs to 32 feet bgs, as interpreted from cross section drawings in the ROW Study Report.

The Rock Aquifer is approximately 50 feet bgs over most of the site, and is typically 40 to 45 feet thick in the vicinity of the PRLS. Most borings taken around the perimeter of the landfill indicate that a confining clay seam directly overlies the Rock Aquifer. Adjacent to Little Sixmile Creek, the Rock aquifer is shallower (20 to 30 feet bgs), which corresponds to a lower ground surface topography along the creek. The Rock aquifer consists of weathered, unconsolidated limestone, and is the major water-producing zone in the upper aquifer system. It is the unit tapped by most shallow water wells in Duval County.

Underlying the Rock Aquifer is the Hawthorn Group, which represents the regional upper confining unit for the Floridan Aquifer. The thickness of the Hawthorn group in the region is approximately 400 feet. The potentiometric surface of the Floridan aquifer is above the ground surface in the area.

Hydrogeology of the Upper Sand Aquifer. Based on water level (WL) measurements taken in January 1997 and in December 1998, and based on interpretation of potentiometric contour plots (See Attachment C), the potentiometric surface elevation in the Upper Sand Aquifer ranges from approximately 11 feet above NGVD in the western portion of the landfill to approximately 4 feet above NGVD in the eastern portion of the landfill, indicating a general east-southeast GW flow direction toward Little Sixmile Creek. However, the GW flow direction for the PRLS is reported to be northeast in both the ROD (September 1990) and in the Fourth Quarter GW Monitoring Report (March 1999), which is contradictory to the east-southeast flow direction shown on the GW contour plots. Previous studies have suggested a GW divide just east of Pickettville Road. It appears that Little Sixmile Creek predominantly influences GW flow in an east-southeast direction south of this divide, and that Sixmile Creek influences GW flow in a northeasterly direction north of this divide. This distinction should be made, clarifying GW flow direction in future reports.

Based on GW elevation data collected during the last eight operating quarters, GW levels have fluctuated up to 5 feet. Reported horizontal flow rates range widely from 23 feet/year (Fourth Quarter 1998 GW Monitoring Report) to 3.3 miles/year (ROD). Vertical GW flow gradients between the Upper Sand Aquifer and the underlying Rock Aquifer are reported to be generally downward in wells located away from Little Sixmile Creek, and generally upward in wells located near the creek.

Hydrogeology of the Rock Aquifer. The potentiometric surface elevation of the underlying Rock Aquifer ranges from approximately 11 feet in the southwest portion of the landfill to approximately 7 feet in the northeast portion of the landfill, indicating a northeasterly GW flow direction, which is also the flow direction reported in the ROD and the Fourth Quarter GW Monitoring Report. Based on GW elevation data collected

during the last eight operating quarters, GW levels have fluctuated up to 2 feet. Horizontal GW flow rates reported and/or calculated from the ROD range widely from .22 miles/year to 10.6 miles/year. Vertical GW flow gradient data between the Rock Aquifer and underlying Hawthorn unit is limited, but does suggest minimal flow in either direction between the two units.

B. Site Chronology

The following text is borrowed in large part, with modifications and additions, from the EPA Record of Decision (ROD) document and ROD abstract (September 28, 1990), the Remedial Action (RA) Construction Report (June 1997) by Golder Associates Inc., Jacksonville Florida, and the Groundwater Monitoring Report, Fourth Quarter 1998 (Golder Associates, March 1999).

History of Disposal. In the early 1940's, there may have been limited disposal at the PRLS. However, it's primary usage was that of a borrow pit for sand until the 1960's. Borrow pit excavations were generally to a depth of 50 feet over most of the site. Full-scale landfill operations began in 1968 when the City of Jacksonville began leasing the property. Until 1971, all types of wastes were disposed at the site, including municipal waste, and industrial wastes such as oil, lead-acid battery liquid waste, battery casings, light terpene sludge, and polychlorinated biphenyls (PCBs). At that time, the site was dedicated for the disposal of hazardous wastes. Inspections conducted by the County Department of Health and Welfare in 1975 and 1976 revealed many improper waste disposal and maintenance practices, and subsequently all waste disposal at the site ceased in July 1977. The City closed the landfill that same year by constructing a soil cover that was seeded with vegetation. Based on review of the ROD, historic disposal practices resulted in wastes coming in contact with soil and groundwater, and possible leaching into Little Sixmile Creek.

Enforcement and Compliance Activities. In July of 1981, the Environmental Protection Agency (EPA) conducted a site reconnaissance at the PRLS which included sampling of GW, surface water, soil, and leachate. The PRLS was subsequently proposed for inclusion on the National Priorities List (NPL) in October of 1981. A Hazard Ranking System (HRS) score of 42.92 was generated, and the PRLS was listed on the NPL in September of 1983. By 1986, potentially responsible parties (PRP's) were identified, forming the PRLS Group. Under Consent Order with EPA, the PRLS Group completed a Remedial Investigation (RI) in July of 1987, an Additional Site Characterization (ASC) Report to address deficiencies in the RI in November of 1988, and a draft Feasibility Study (FS) Report in September 1989. The EPA revised the FS Report and performed a Site Specific Risk Assessment in June 1990, and executed the Record of Decision (ROD) on September 28, 1990. The selected remedy, as stated in the ROD, includes the following components: institutional controls, installation of a protective cover system and security fence, a long-term GW monitoring program, provision of city water to residences north of the site, plug and abandonment of supply wells located north of the site, and restoration of Little Sixmile Creek. Based on the ROD, the PRLS Group

and EPA developed a Scope of Work (SOW) for conducting the Remedial Design/Remedial Action (RD/RA). The Final RD report was approved by the EPA in September 1993. The RA was implemented during the period from approximately February 1994 to February 1997. The RA Construction Report, with Addendum, was approved by EPA in July 1997, which effectively started the Operations and Maintenance (O&M) period. Under the terms of the ROD, the O&M period is 20 years, to be concluded in July of 2017. The following additional characterization studies have been performed since the commencement of RA activities: GW Contamination Assessment at the Realco Landfill Site (Spring 1997), Temporary Well Point Investigation (Fall 1998), Sixmile and Little Sixmile Creek Study (Fall 1998), and the Right of Way Study (Spring 1999). A Focused Feasibility Study Plan is currently underway to evaluate contamination at the right-of-way of Pickettville Road and the Realco Landfill Site.

The chronology of the major actions at the PRLS are summarized in Table 1.

Table 1: Chronology of site events.

Event	Date
Limited waste disposal and borrow pit excavation begin.	Early 1940's
City of Jacksonville begins lease; full scale landfill operations begin	1968
Landfill dedicated to the disposal of hazardous wastes	1971
Landfill closed	1977
EPA Site Reconnaissance	July 1981
NPL listing	September 1983
Remedial Investigation completed	July 1987
Additional Site Characterization Report completed	November 1988
Feasibility Study completed	June 1990
Record of Decision (ROD) signature	September 28, 1990
Remedial Design completion	September 1993
Actual RA start	October 1, 1993
Construction start	February 1994
Construction completion	February 1997
RA Construction Report Approved; O&M Period begins	July 1997
GW Contamination Assessment at the Realco Landfill Site	Report dated Match 1997
Realco Site Investigation at Sixmile and Little Sixmile Creeks, Realco, Landfill Site	Report dated September 1998
Temporary Well Point Investigation	Report dated December 1998
Sixmile and Little Sixmile Creek Study, Realco Landfill Site	Report dated December 1998
Right-of-Way Study	Letter Report dated June 23, 1999

III. Results of Site Investigations

A. General

Pre-ROD Investigations:

A summary of the investigations leading to the ROD is provided in Section II.B of this report. Based on results from the RI and ASC investigations, contaminants of concern, pathways, and risks were established and are summarized below. Sections 5.3 to 5.8 of the ROD present detailed summaries of the RI and ASC results for surface water sampling, hydrogeologic studies, groundwater sampling, ecological studies, surface soil sampling, and sediment and surface water sampling.

Post-ROD Investigations:

In October 1998, Golder Associates Inc. conducted an assessment of surface water quality of the portions of Sixmile and Little Sixmile Creeks which border the PRLS and Realco Landfills. The creek sampling did not indicate any constituents above either the Florida Surface Water Standards or the Brownfields surface water standards.

In October and November of 1998, Golder Associates Inc. conducted a Temporary Wellpoint Investigation which focused on the groundwater quality conditions along the eastern and southern property boundaries between the landfill and Little Sixmile Creek. Seventeen temporary monitoring wells were installed, and groundwater samples collected from each well. The sampling results indicated detections above the groundwater standards for arsenic at one location (TWP-13), vinyl chloride at another location (TWP-15), and lead at several locations. Subsequent re-sampling with low-flow purging techniques resulted in lead concentrations being lower than detection limits. Based on results from surface water sampling along Little Sixmile Creek, arsenic and vinyl chloride in the groundwater at the PRLS has not affected the surface water quality in the creek. Additional investigation in the immediate area of the vinyl chloride detection revealed that the extent of vinyl chloride contamination was confined to TWP-15. Concentrations of vinyl chloride have also shown a significant decreasing trend from the initial detection, based on subsequent samplings. The extent of arsenic contamination is being further addressed under the focused feasibility study.

In April and May 1999, Golder Associates Inc. conducted a geoprobe investigation in the vicinity of the right-of-way of Pickettville Road. Soil and groundwater samples were collected, and hydraulic conductivity testing was performed. One permanent monitoring well was also installed, RMW-1. A small, narrow zone of relatively higher permeability and contaminated groundwater was identified. Volatile organic compounds were detected above MCL's at several locations. Chemical and hydraulic boundaries were estimated. These estimated boundaries will be the focus of source control alternative evaluations in the focused feasibility study.

B. Contaminants of Concern

The following constituents (see Table 3-1 and 6-1 of the ROD) were identified as contaminants of concern based on the results of RI and ASC sampling and analysis, and a baseline risk assessment:

Surficial Soil- arsenic, barium, chromium, lead, mercury, nickel, selenium, pyrene, bis (2-ethylhexyl) phthalate, fluoranthene, fluorene, phenanthrene, pyrene, PCB-1260

Groundwater: Upper Sand Aquifer- arsenic, barium, lead, mercury, nickel, acetone, benzene, toluene, vinyl chloride, bis (2-ethylhexyl) phthalate, delta-BHC, cyanide

Groundwater: Rock Aquifer- barium, lead, mercury, nickel, acetone, delta-BHC, cyanide

Sediment- arsenic, barium, lead, mercury, selenium, acetone, 2-butanone, carbon disulfide, methylene chloride, bis (2-ethylhexyl) phthalate

Surface Water- methylene chloride, bis (2-ethylhexyl) phthalate

Buried Wastes (volatization)- acetone, 2-butanone, carbon disulfide, methylene chloride, toluene, trichloroethene

C. Potential Pathways for Contaminant Migration

Potential pathways of exposure were identified in the ROD as follows: ingestion of GW from the surficial or rock aquifers, direct contact with surface water, sediments and surficial soils, inhalation from both the surficial soil and the buried waste and ingestion of contaminated fish tissue. A discussion of each exposure scenario that was evaluated in the ROD follows:

Groundwater Consumption. There is no known current consumption of GW from the Upper Sand Aquifer in the vicinity of the PRLS. However, it is classified as a potentially potable drinking water aquifer by the State of Florida. In the ROD, it is stated that four homes north of PRLS may use wells which draw from the rock aquifer. Subsequently, two components of the selected remedy in the ROD were chosen to address the risks associated with this potential pathway. These were to extend the city water main to residents located in the affected area immediately north of the site, and implementation of a plug and abandonment program for the wells in the affected area. The implementation of these two components were executed and subsequently reported in the Remedial Action Report for Water Line Installation, Well Abandonment, Site Fencing, and Institutional Controls (Golder Associates, June 1993).

Direct Contact/Ingestion of Surface Water & Sediment. Potential exposure scenarios are dermal contact with affected surface water and sediment and/or accidental consumption by children playing in the creek or by persons who fish in the creek.

Direct Contact and/or inhalation of Surface Soils and Buried Waste. A potential exposure scenario for direct contact and/or inhalation of surface soils was taken into consideration due to the fact that there was evidence of human activity at the site. The construction of the landfill cap and erection of the perimeter fence addressed this risk. Inhalation of volatilized chemicals was considered as a future risk.

Ingestion of Contaminated Fish Tissue. This exposure scenario was taken into consideration due to the fact that people fish in Sixmile Creek, and edible crabs have been seen in Little Sixmile Creek. The potential pathway evaluated was consumption of fish/crab tissue which may have bioaccumulated hazardous levels of a particular contaminant of concern.

D. Summary of Site Risks

Excess Cancer risks (ECRs) associated with exposure to potentially carcinogenic chemicals have been calculated and reported in the ROD in Table 6-5. Hazard quotients (HQs) associated with exposure to a single non-carcinogenic contaminant in a single medium have been calculated and reported in the ROD in Table 6-4. Hazard indexes (HI's) have been generated by totaling the HQ's for each medium, and are useful for gauging the potential significance of multiple contaminant exposures. HI's are reported in Table 6-4 of the ROD.

Groundwater Consumption. Risk characterization studies in the ROD revealed that calculated ECR values exceeded the target range for the following contaminants of GW in the Upper Sand Aquifer: total carcinogenic chemicals, arsenic, benzene and vinyl chloride. The total HI calculated for the Upper Sand Aquifer also exceeded the target level. However, as stated in the paragraph above, there is no known consumption of Upper Sand Aquifer GW, either within the boundary of contaminant plumes which have been delineated, or in the general vicinity of the PRLS. The supply of city water to potentially impacted residences north of PRLS, and abandonment of wells north of the site has further reduced risks associated with GW consumption. The GW quality of the Rock Aquifer was reported in the ROD to be acceptable for consumption. GW monitoring data from the Rock Aquifer gathered subsequent to the ROD has generally confirmed this.

Contact with Surface Soil. The cumulative ESR and HI values for soil contact were reported in the ROD to be within the target range, marginally in the case of the ESR. Construction of the landfill cap and perimeter fence have virtually eliminated any present risks associated with soil contact. Therefore, human health is not considered at to be at risk.

Contact with or Consumption of Surface Water and Sediments. The total ESR and HI values were reported in the ROD to be within the target range. Surface water samples collected since the ROD have been clean. It can be stated that human health is not considered to be at risk due to any possible contact with or consumption of surface water in the vicinity of the PRLS.

Ingestion of Contaminated Fish Tissue. The ECR and HI values for fish ingestion were reported in the ROD to be within the target range, marginally in the case of the ECR. Although fishing is known to occur at Sixmile Creek, since ECR and HI values are within the target range, human health is not considered to be at risk.

Hypothetical Future Cumulative Risks. Adding the risks associated with future hypothetical consumption of Upper Sand Aquifer GW, the hypothetical future ECR of all media and HI were calculated to exceed the target level. However, assuming that the selected remedies remain in place and effective, human health would not be at risk in the future.

IV. Summary of Response Actions

A. Remedial Objectives

The objectives of remedial action, as stated in the ROD, were to address surficial soil contamination and waste materials at the site and to provide for the remediation of potential GW threats to the environment. Surficial soil/waste material problems would be rectified by establishing baseline conditions for comparison, minimizing the potential for direct exposure to the landfill material, limiting the potential for future indiscriminate dumping at the site, addressing the Florida Department of Environmental Protection (FDER at that time) statutory requirements for closure and post-closure care of municipal landfills, and by assisting in the management of future leachate generation. Future GW threats would be remediated by establishing baseline conditions for comparison, minimizing hypothetical future exposure risks via consumption, and reducing the potential for future regional migration of GW constituents associated with the landfill.

B. Remedy Selection

The ROD was signed on September 28, 1990. The selected remedy, as paraphrased from the ROD, includes the following components: (1) implementation of institutional controls such as deed restrictions and GW usage restriction, (2) installation of a protective cover system that complies with FDER (now FDEP) regulations, (3) installation of a perimeter security fence to restrict unauthorized access to the site, (4) implementation of a long-term GW monitoring program, (5) extension of the city water main to residents located immediately north of the site to supply an alternate source of potable water, (6) implementation of a plug and abandonment program for water supply wells located in the area immediately north of the site, and (7) restoration of

Little Sixmile Creek, an ecological study of Little Sixmile Creek, and any necessary remediation of Little Sixmile Creek based on the ecological study.

C. Remedy Implementation

Based on the ROD, the PRLS Group and EPA developed a Scope of Work (SOW) for conducting the Remedial Design/Remedial Action (RD/RA). The Final RD report was approved by EPA in September 1993.

Implementation of the seven components of the selected remedy has been divided into two Operable Units (OU). The OU-1 remedial action consisted of execution of the following components (described in the paragraph above): 1, 3 (Pickettville Road frontage fencing), 5, and 6. The OU-2 remedial action consisted of execution of components 2, 3 (remainder of PRLS fencing), 4 and 7. OU-1 actions were handled through City of Jacksonville's standard contracting procedures and subsequently reported in the Remedial Action Report for Water Line Installation, Well Abandonment, Site Fencing, and Institutional Controls (Golder Associates, June 1993). The design of the long-term GW monitoring program (component 4), was presented in the Revised Groundwater Monitoring Plan (Golder Associates, June 1993). The Ecological Study for the PRLS, (part of component 7), was presented in the Final Ecological Study Report (Golder Associates Inc., September 1993a). The execution of components 2, 3, 4, and 7 was accomplished during the time period from February 1994 through January 1997, and was subsequently reported in the RA Construction Report w/addendum (Golder Associates, June 1997).

The following is a overview of the various systems which were installed at the landfill during the RA construction period.

Landfill Cover System. The cover system consists of general fill material, a geosynthetic clay liner (GCL), and an 18-inch thick vegetative layer. Approximately 300,000 CY of general fill material was used for backfilling excavations, covering waste which was reapportioned on the site, and for providing minimum grades for the final cover. Approximately 41 acres of GCL was installed over the general fill layer. The vegetative layer consisted of a minimum of 18 inches of fill material placed over the GCL, including the perimeter berm areas and the main cover area. The cover fill material was seeded with a mixture of Pensacola Bahia grass and Gulf Annual Rye grass and fertilized. The perimeter ditches and pond sideslopes were sodded.

Surface Water Management System. The surface water management system includes a system of perimeter ditches, two retention ponds, and a system of emergency spillways (one at Pond #1 and three at Pond #2). The perimeter ditches collect run-off from the landfill cover area and discharge into the two on-site ponds. The two ponds were designed to have a storage capacity for the first ½ inch of run-off. The emergency spillways were designed to handle excess run-off and to discharge run-off to Little Sixmile Creek.

Groundwater Monitoring System. The GW monitoring well system was designed to monitor the Upper Sand Aquifer and Rock Aquifer along the western side (Pickettville Road) of the site and along the northern and eastern sides (along Little Sixmile Creek). The downgradient wells include nine in the Upper Sand Aquifer (SMW-4, -7R, -8, -9, -10, -15, -17, -18, and -19), six in the Rock Aquifer (DMW-7, -8, -10, -15R, -17, and -18), and two in the deeper portions of the Rock Aquifer at the contact point with the Hawthorn unit (HCW-7 and HCW-15). Additionally, two monitoring well clusters were installed to monitor background conditions (SMW-1/DMW-1 and SMW-16/DMW-16). More recently, a shallow background monitoring well, SMW-22, was installed to replace SMW-16 (although SMW-16 has not yet been decommissioned).

Gas Control System. The landfill gas collection system consists of a gas collection trench (backfilled with #57 stone) with a depth ranging from 8 to 15 feet, with a system of gas collection pipes and vents (approximately 30) to collect and dissipate the gas generated within the landfill. The gas collection trench extends along the perimeter of the landfill except for the side adjacent to Little Sixmile Creek. The gas monitoring system consists of 41 gas probes (GP-1 to GP-43; based on field conditions, gas probes designated GP-17 and GP-21 were not installed) installed at approximately 200 foot intervals around the outside of the trench, and at 400 foot intervals on the inside of the trench. Due to limited space between the trench and landfill boundary in some areas, six gas probes were installed flush mounted off-site to maintain the appropriate distance from the trench for monitoring.

Fencing. A six foot high perimeter fence was installed, with twisted/barbed bottom and top selvages.

D. Operation and Maintenance

The operation and maintenance period effectively started with the approval of the RA Construction Report by EPA in July 1997. Under the terms of the ROD, the O&M period is 20 years, to be concluded in July of 2017. Two years, or eight operating quarters have already elapsed in the O&M period. At the time of the writing of this report, the ninth operating quarter (July 1999 to September 1999) is in effect.

Routine O&M. The following are components of routine O&M activities for the PRLS: site inspections, closure cover maintenance, surface water management system maintenance, GW monitoring system maintenance, gas control system maintenance, GW monitoring, gas monitoring, and surface water discharge monitoring. A discussion of each of these activities follows.

Site inspections are required on a quarterly basis for the first two years of the O&M period, then semi-annually thereafter. For the first eight operating quarters, site inspection results and maintenance activity reports have been submitted by the O&M contractor (Golder Associates Inc.) to EPA in quarterly Progress Reports. Review of several progress reports showed that these have been satisfactorily completed.

Closure cover maintenance requirements include: mowing the vegetative cover at least twice per year, erosion repair, repair of damaged GCL, fertilizing and re-seeding as necessary, and repair of areas of subsidence. Based on interviews with Wendy Karably of Golder Associates, observations during the 5 year review site inspection, and review of several quarterly progress reports, these requirements are being performed satisfactorily.

In general, surface water management system maintenance requirements include the following on an as-needed basis: removal of debris and silt from the various components of the drainage system (eg. ditches, culverts, spillways, etc.), repair of erosion or damage in rip-rap areas, Enkamat areas, and spillway areas. Based on interviews with Wendy Karably of Golder Associates, observations during the 5 year review site inspection, and review of several progress reports, these requirements are being performed satisfactorily. Due to excessive erosion, the northern area of Pond #2 has been repaired twice. The repair activity consisted of replacement of soil, grading, re-seeding and sodding. Accumulated silt in Pond # 2 has also been removed with backhoe as necessary. Drainage ditches have been cleaned as necessary.

Groundwater monitoring system maintenance requirements consist of inspection of the monitoring wells each time samples are collected, and repair as needed. Based on interviews with Wendy Karably of Golder Associates, observations during the 5 year review site inspection, and review of available documentation, these requirements are being performed satisfactorily. All wells installed during the RA are in good condition, with the exception that many locks were reported to be suffering from corrosion, as stated in the Fourth Quarter 1998 Progress Report. Monitoring Well No. SMW-1, installed during the remedial investigation, was repaired by replacing the protective casing due to corrosion and rust.

Gas control system maintenance requirements consist of inspection of monitoring probes and gas vents each time gas measurements are obtained, and repair of damaged vent pipes and/or monitoring probes within 60 days of discovery of the malfunctioning unit. Based on interviews with Wendy Karably of Golder Associates, observations during the 5 year review site inspection, and review of available documentation, these requirements are being performed satisfactorily, with the exception of one exceedance of the 60 day time frame mentioned above. The Progress Reports for Fourth Quarter 1998 and First Quarter 1999 reported that one gas vent turbine was missing and that another was damaged. Ms. Wendy Karably of Golder Associates stated that these were being replaced/repared on the week of August 2, 1999. The required repairs exceed the requirement that damaged or malfunctioning units be repaired within 60 days of discovery, as stated in the O&M plan and as required under the Florida Administrative Code (F.A.C.) Rule 62-701.620(7) (formerly 17-701.075 FAC). This exceedance is judged to have no impact on overall system functionality or on protectiveness, because the turbines are designed to enhance, not enable flow from the vent.

Routine Monitoring and Laboratory Testing. In general, routine GW monitoring requirements consist of GW sampling and analysis on a quarterly basis for the first year of the O&M period, and semi-annually thereafter. Deep wells DMW-10 and DMW-18 will be monitored at the same frequency but may be decommissioned after 3 years if no landfill-related contamination is detected. Shallow wells SMW-4, 9, 10, 18, and 19 will be monitored quarterly for the first three years, then semi-annually, thereafter. Based on review of quarterly progress reports and quarterly GW Monitoring reports, and based on interviews with Ms. Karably of Golder Associates, GW monitoring has been conducted during the last 8 operating quarters in accordance with the requirements and schedule laid out in the O&M plan and Groundwater Monitoring Plan. A review of GW data results associated with O&M routine sampling is given in Paragraph "E" of Section V of this report.

Routine gas monitoring requirements consist of measuring soil air pressure and combustible gas concentrations at gas monitoring probes, quarterly for the first two years of the O&M period, then semi-annually thereafter. It also involves inspecting the entire landfill area for evidence of gas seepage such as stressed vegetation, cracks in the surface layer, and unusual odors. Review of the Fourth Quarter 1998 and First Quarter 1999 Progress Reports indicate that the gas monitoring system is functioning as designed. Several gas probes located within the landfill, inside the gas collection trench, had measurements above 100% lower explosive limit (LEL), which is above the action limit. Measurements taken at gas probes located outside of the gas collection trench were below action levels, indicating that gas is not migrating from the landfill, and that no further action is warranted with respect the probes where gas concentrations exceeded action levels, other than continuing to closely monitor gas concentrations in these probes. However, GP-42, located outside of the gas collection trench, indicated measurements above 100% LEL. This probe is located near former leaking underground storage tanks (UST) at LTPC property, and the detections are likely the result of soil gas emanating from residual soil contamination associated with these former USTs.

Surface Water Discharge Monitoring requirements consist of collecting surface water samples at the NPDES discharge point on a quarterly basis for the first two years of the O&M period, then semi-annually thereafter. Review of quarterly progress reports indicate that a surface water discharge sample was not collected during First Quarter 1999, which appears to be in violation of the requirement for quarterly sampling. The reason for this omission is not stated in the report. A surface water sample collected in October 1998 from the NPDES discharge point was described as "clear, low turbidity, and no visible sheen".

O&M Cost Data. The original cost estimate for the 20 year O&M period, which was completed during the Remedial Design phase, was approximately \$3,000,000. For the first two years of the O&M period, actual O&M costs have been within the budgeted amount. In Table 4, actual costs for the first two years of the O&M period are presented, along with estimated costs for the remainder 20-year O&M period. The cost

projections in Table 4 are revised periodically to take into account interest rate projections and cost savings.

V. Summary of Site Visit and Findings

A. General

This five-year review consisted of the following activities: a review of relevant documents (see Attachment A, Documents Reviewed); interviews with the EPA Project Manager and O&M contractor Project Manager, a site inspection, and preparation of the five year review report. The completed report will be placed in the local repository. Notice of its completion will be placed in the local newspaper, and local contacts will be notified by letter.

B. Interviews

EPA Region IV Remedial Project Manager, Mr. David Lloyd. Mr. Lloyd was interviewed on several occasions: during the May 1999 USACE visit to EPA Region IV office, and during several subsequent phone conversations. Mr. Lloyd provided background information on the PRLS, a history of site activities, and information on ongoing site activities. Mr. Lloyd provided documentation which was reviewed for this report. Much of what was learned from Mr. Lloyd is included in this report.

Golder Associates Inc., Project Manager, Ms. Wendy Karably. Ms. Karably was interviewed on several occasions: during the June 30, 1999 site visit, and during several subsequent phone conversations. During the site inspection, Ms. Karably guided the tour of the landfill, providing commentary on features of the landfill system, sampling activities, and other background information. Several other pieces of documentation were obtained from Ms. Karably, which were reviewed for this report. Much of what was learned from Ms. Karably was included in this report.

C. Site Inspection

General. _The five-year review site inspection for the PRLS was held on June 30, 1999. The weather was warm, with cloudy skies and some light rain.

The following individuals were in attendance:

1. Ed Villano, USACE, Jacksonville District, Project Engineer
2. Greg Mellema, P.E., USACE HTRW Center of Expertise, Geotechnical Engineer
3. Eric Hines, P.E., USACE HTRW Center of Expertise, Technical Manager
4. Wendy Karably, Golder Associates Inc., Project Manager

During the site inspection, the following features were inspected or observed: perimeter fence, landfill cover, site drainage, two retention ponds, concrete spillway, drainage

ditches, monitoring wells, gas vents, gas monitoring probes, siltation fences, and general site conditions. During the site inspection, groundwater sampling was being conducted during the site inspection by Golder Associates Inc. as part of the Quarterly monitoring program.

Cover System. In general, the cap on the landfill is in good condition. The cover system consists of a subgrade layer, a geosynthetic clay liner (GCL), and 18 inches of vegetative cover soil. Slopes on the cover system are generally 3 to 4%, with some areas a bit steeper towards the site perimeter. The vegetation was in good condition. The cover did have some erosion of the cover soils in various locations. The areas of erosion noted were small gullies, perhaps 4 to 6 inches deep and located primarily towards the lower portions of the cover. The cover system relies on sheet flow off the cover into perimeter drainage ditches, with no berms or swales located on the landfill cover. Silt fences were installed in some areas to help control erosion while the vegetation was being established. Several areas of sagging or collapsed silt fencing were noted, and mild erosion was noted in one area. These areas should be repaired. Due to recent precipitation, the portions of the cover soils may have been saturated, with shallow ponded areas (less than 2-3 inches) scattered over the cover. The ponding may have been a result of recent rainfall not having completely infiltrated into the soils. There were no areas of slides, sloughs, or settlement noted.

Landfill Gas Control System. The gas control system consists of a perimeter gravel filled trench with a perforated header pipe installed. A vertical vent pipe is connected to the perforated header every 200 feet and gas is passively vented to the atmosphere. A few of the vent risers located on the northwest side of the landfill were noted to be leaning somewhat from vertical. Ms. Karably of Golder Associates Inc, indicated that this was a result of the construction process, and that inspection during construction revealed no damage to these pipes or the vent pipe connectors had occurred. The gas control system is monitored by several clusters of gas monitoring probes located both inside and outside the gas collection trench perimeter. The gas collection system appears to be functioning adequately at this time.

Site Drainage Features. Surface water runoff collects in a series of perimeter ditches and two ponds. The ponds provide stormwater retention before releasing into nearby Little Sixmile Creek. Pond No. 1 appears to be in good condition. The spillway channel from Pond No. 1 is sloped to grade and does not have areas of standing water. Ditch No 3, located on the eastern edge of the landfill cover has some areas of weedy growth which could hinder flows. Pond No. 2, located along the southeastern edge of the landfill has some areas of erosion located between the cover system and the pond. Sheet flow from the cover system concentrates to some degree in this area, causing the minor erosion of the pond's banks.

Monitoring Wells. In general, the monitoring wells observed appeared to be in good condition.

Site Security. Perimeter fencing appears to be adequate, with no damage noted. There was no damage due to vandalism noted during the site visit.

D. Review of Applicable or Relevant and Appropriate Requirements (ARARs)

An ARAR review was performed for the site in accordance with the draft EPA guidance document, "Comprehensive Five-Year Review Guidance," EPA 540R-98-050, April 1999.

Documents reviewed for the ARAR analysis:

1. Record of Decision, 28 Sept 1990
2. 1998 Fourth Quarter Groundwater Monitoring Report (Golder Associates)
3. December 1998 Sixmile and Little Sixmile Creek Study Report (Golder Associates)

ARARs Identified in the ROD Requiring Review:

1. Resource Conservation and Recovery Act (RCRA) hazardous waste Treatment, Storage, Disposal Facility (TSDF) location requirements.
2. Florida Solid Waste Landfill Closure Requirements of the Florida Administrative Code (FAC) 17-701.070 (currently codified as FAC 62-701.600)
3. 40 CFR Part 264.99 Compliance Monitoring Program
4. Federal Ambient Water Quality Criteria (AWQC)
5. FAC Chapter 17-3, Maximum Contaminant Levels (MCLs) for Class III surface water bodies (Currently codified at FAC 62-302.500 and 62-302.530)

Surface Water Related ARAR Review: A copy of the Florida State surface water quality standards in place at the time of the ROD signing (1990) could not be accessed for this review. However, per EPA's Five-Year Review Guidance document, old standards are to be compared to new standards to evaluate whether or not the newer standards are more stringent and whether or not the remedy is meeting the more stringent standards. For purposes of this review, it is assumed that the current standards are at least as stringent as the 1990 standards and therefore usable in the ARAR analysis process.

The original design for the landfill stormwater control system did not include any discharge directly to surface water bodies, except for overflow from the emergency spillways. Therefore, no surface water sampling program was required. Since the original design was completed, there were modifications made to Pond No. 2 that resulted in discharge of treated stormwater to Little Sixmile Creek. Requirements for sampling of the discharge were incorporated into the quarterly monitoring program under the National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit. Since discharge from the pond is currently regulated under NPDES permit, it is assumed that the State of Florida Surface water quality criteria is currently being met.

The December 1998 Sixmile Creek study was conducted to evaluate contamination associated with the right-of-way and Realco sites, and was not part of routine O&M

sampling for the PRLS. A plan that included surface water sampling points and parameters was submitted to and approved by EPA. This plan did not incorporate the full list of 71 Florida surface water parameters for Class III freshwater, or the full list of Federal Ambient Water Quality Criteria (AWQC) parameters, since sampling and analysis of some of these parameters was judged to be unnecessary for the PRLS. Results of the December 1998 study indicated that there were no constituents above either the Florida Surface Water Standards or the Brownfields surface water standards.

Groundwater Related ARAR Review: The ROD identifies the RCRA GW Compliance Monitoring Program codified at 40 CFR 264.99 as a GW ARAR for the site. Basic requirements of 40 CFR 264.99 include:

- Sampling of wells annually for Appendix IX to 40 CFR 264 at least annually unless otherwise negotiated with EPA.
- Meeting GW protection standards of 40 CFR 264.94, including no exceedances in the upper aquifer of those contaminants listed in Table 1 to 264.94. These contaminants include arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, endrin, lindane, methoxychlor, toxaphene, 2,4-D and 2,4,5-TP (Silvex).

During the RD process, a groundwater monitoring program was developed and approved by EPA which includes a specific list of parameters for analysis for the PRLS. This approved list does not include every parameter listed in Appendix IX, since sampling and analysis of some Appendix IX parameters was judged to be unnecessary for the PRLS. The EPA-approved sampling program calls for sampling and analysis of 10 of the 14 parameters listed in Table 1 of 40 CFR 264.94. Exceedances of GW MCLs for the PRLS are discussed in Paragraph "E" below. Groundwater contamination in the right-of-way of Pickettville Road and Realco landfill is being addressed under a Focused Feasibility Study at present.

Landfill Cover Related ARAR review: The major requirements of Florida State solid waste landfill closure regulations (62-701 FAC) have not significantly changed since the PRLS ROD was signed in 1990. It is not anticipated that any changes to the old standards not being attained by the current landfill cover would adversely impact the overall protectiveness of the remedy. Per the five-year review team project engineers, the current PRLS landfill cover is in good condition with only minor deficiencies, and is still adequately controlling infiltration, surface runoff, and migration of contaminants.

General ARAR Related Protectiveness Summary: Although groundwater MCLs have been exceeded at several locations at the PRLS and at the right-of-way of Pickettville Road, there does not appear to be an immediate threat to the protectiveness of the remedy. The Sixmile and Little Sixmile Creek study in December 1998 showed that surface water quality was not being impacted by groundwater contamination originating from the PRLS. Groundwater usage restrictions and supply of city water to residents north of the PRLS have addressed the risks associated with the groundwater ingestion

pathway. However, issues with long-term protectiveness of the remedy need to be further addressed, especially as it relates to potential contaminant sources in the right-of-way of Pickettville Road.

E. Groundwater Data Review

Since the beginning of the O&M period in July of 1997, there have been eight quarterly sampling and analysis events at the PRLS. Results of the last three quarterly sampling events are shown in Tables 1 through 3. GW monitoring exceedances are shown in Attachment B. During the last seven quarters, Arsenic was detected above MCL's at SMW-18, which is located between Little Sixmile Creek and the north end of Pond No. 2. Chromium and Nickel were detected above MCLs at SMW-16 in July 1999. Lead was detected above the MCL in several wells. Volatile organic compounds were detected above MCLs in the right-of-way of Pickettville Road during the 1998 geoprobe study and at Realco landfill. Groundwater flow parameters are summarized in Section II.A of this report.

VI. Assessment

The following conclusions support the determination that the remedy at the PRLS currently remains protective of human health and the environment:

Effectiveness of Remedy: As noted above, the landfill cover system is in good condition. There is adequate vegetative cover, with only mild signs of erosion. The gas collection system appears to be functioning adequately at this time. The site drainage system is adequate, with only minor repair work required. Monitoring wells are in good condition and functioning adequately. Perimeter fencing appears to be adequate. The selected remedy remains protective of human health and the environment for the PRLS. Although these conditions appear to indicate that the remedial actions continue to be effective, GW monitoring results and additional sampling efforts indicate that GW is being impacted in the right-of-way of Pickettville Road immediately north of the PRLS property. The contaminant levels, although in excess of MCLs for several constituents, do not appear to pose an immediate threat to human health and the environment at this time. Contamination in the right-of-way of Pickettville Road and the Realco Landfill will be further addressed in the Focused Feasibility Study, which is underway at present.

Adequacy of O&M: O&M procedures are consistent with requirements. No significant difficulties have occurred to date.

Early Indicators of Potential Remedy Failure: No early indicators of potential remedy failure were noted during the review. O&M costs and maintenance activities have been consistent with expectations.

VII. Deficiencies

The following deficiencies were discovered during the five-year review. These deficiencies are judged to not be significant enough to affect protectiveness at present, but should be addressed.

A. The east-southeast GW flow direction depicted in the GW contour plot for the Upper Sand Aquifer (see Attachment C) is in contradiction with the northeast GW flow direction stated in the text of the ROD (Section 5.4, Paragraph No. 2) and in the text of the Fourth Quarter GW Monitoring Report (Section 3.1, Paragraph 3). A rough GW contour plot hand-drawn by the author using raw data from RA well installations (Table 4 or the RA Construction Report) confirmed the east-southeast GW flow direction. See Section II.A of this report for more discussion on this.

B. The reported range of horizontal GW flow rates for the Upper Sand Aquifer and Rock Aquifer seems excessive. Refer to Section 2.A of this report for details.

C. During the site inspection, localized areas of erosion consisting of small gullies (4 to 6 inches) were observed.

D. Several areas of sagging or collapsed silt fencing were observed.

E. A few of the vent risers located on the northwest side of the landfill were noted to be leaning somewhat from vertical. Although currently scheduled for replacement, two damaged/missing gas vent turbines were not replaced/repared within the 60 day time frame required under 62-701.620(7) F.A.C.

F. Ditch No 3, located on the eastern edge of the landfill cover has some areas of weedy growth which could hinder flows.

G. Pond No. 2, located along the southeastern edge of the landfill has some areas of erosion located between the cover system and the pond.

H. The boundary of a narrow zone of GW contamination (with concentrations in excess of MCLs) requires further delineation in the area underlying the right-of-way immediately north of the PRLS property boundary. The Right-of-Way Study Report does not address the extent of the northern boundary of this zone.

I. Many monitoring well locks were reported to be suffering from corrosion, as stated in the Fourth Quarter 1998 Progress Report.

J. Several gas probes located within the gas collection trench indicated measurements above 100% lower explosive limit (LEL), which is above the action limit. Another probe, GP-42, located outside of the gas collection trench, also indicated measurements above 100% LEL.

K. A NPDES surface water sample was not collected during First Quarter 1999, which appears to be in violation of the requirement for quarterly sampling.

VIII. Recommendations

The following recommendations are made to address the deficiencies noted above:

A. Recommend reviewing all documentation where GW flow directions are reported, and re-evaluate the basis for these reported flow directions. In future documentation, the distinction needs to be made between the east-southeast GW flow direction south of the GW divide, as influenced by Little Sixmile Creek, and the northeast flow direction north of the GW divide, as influenced by Sixmile Creek.

B. In future documentation, when applicable, recommend stating a range of horizontal flow rates which is representative of the best and most recent data.

C. Continue to monitor the cover erosion. If erosion gullies continue to develop, it may be beneficial to consider soil reinforcement or additional vegetative cover.

D. Repair or remove damaged silt fencing.

E. Continue to periodically inspect vent risers that are leaning to ensure that no damage has occurred to either the underlying geosynthetics or perforated pipe connection. Comply with the 60 day requirement for repair/replacement of damaged monitoring devices, unless written exception is obtained from Florida Department of Environmental Protection (FDEP), per 62-701.620(7) F.A.C.

F. Periodically inspect water flow through Ditch #3 to ensure flow is unhindered by growth. Trim/remove weeds as necessary.

G. Repair areas of minor erosion at Pond No. 2.

H. As stated in Golder Associates' letter report of Additional Right-of-Way Studies (June 23, 1999), estimated boundaries of the zone of higher permeability and contamination require further delineation as part of the Focused Feasibility Study. Source control measures need evaluation. Although the northern boundary of contamination has been delineated in other investigations, suggest cross-referencing relevant results from related investigations so that a fuller picture can be seen from the reading of any one report.

I. Continue to monitor the extent of lock corrosion and replace all corroded locks as needed.

J. Continue to closely monitor LEL levels the exceed action levels on a quarterly basis.

K. Comply with quarterly sampling requirements for NPDES surface water sampling and state reason for non-compliance in quarterly progress reports.

IX. Protectiveness Statement

The remedies at the Pickettville Road Landfill Site remain protective of human health and the environment, at present. However, the areas of contamination identified in the right-of-way of Pickettville Road and the Realco Landfill just north of the PRLS need further evaluation in order to ensure long-term protectiveness. A Focused Feasibility Study Plan is currently underway to accomplish this. In summary:

- The cap appears to be effective at containing contaminants through preventing infiltration of rainwater and preventing direct contact with contaminated soils.
- The gas monitoring and venting system is operating as intended.
- The system of drainage ditches and retention ponds remain effective in routing and retaining surface runoff.
- Exceedances of GW MCLs in the PRLS and in the right-of-way immediately north of the PRLS property boundary do not appear to pose any immediate threat to human health or the environment.

X. Next Review

This is a statutory site that requires ongoing five-year reviews. EPA should conduct the next review within five years of the due date of the first five year review report, which is listed on the signature cover of this report.

Table 4

TABLE 1									
ESTIMATED ANNUAL AND MAINTENANCE COSTS									
(COSTS IN THOUSANDS OF DOLLARS)									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

		Fence Repair	Gate Replacement	Erosion Repair	Grass Mowing	Cover Maintenance	GW System Maintenance	Well Replacement	Gas System Maintenance	GW Sampling & Piezometers	Analytical (Indicators)	Analytical (pest/PCBs)	Analytical (QA/QC)	Analytical (Trip Blank)	Well Decommissioning	GW Reporting	Gas Monitoring	Gas Probe Replacement	Gas Decommissioning	Reporting_Quar/Annual	Site Inspections	Administration	Certification	Five Year Review	EPA Oversight	SW Monitoring	TOTAL COST	PRESENT WORTH (3%)	ACTUAL COSTS (see note)
YEAR																													
1	2.4	0	0	10	0	1	0	2.5	15	35	5	6	1.1	0	10.5	2.5	0	0	7.5	2.5	10	0	0	20	0	131	127.2	137	
2	2.4	0	45.5	10	15	1	10	2.5	8.5	22	2.5	6	1.1	0	10.5	2.5	5	0	7.5	2.5	10	0	0	20	2	186.5	175.8	112	
3	2.4	0	45.5	10	15	1	0	2.5	8.5	22	2.5	6	1.1	2	10.5	2.5	0	0	7.5	2.5	10	0	0	20	0	171.5	156.9		
4	2.4	0	45.5	10	15	1	10	2.5	6	16	0	3	0.5	0	6	1.2	5	0	7.5	2.5	10	0	0	20	0	164.1	145.8		
5	2.4	0	45.5	10	15	1	0	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	50	20	0	199.1	171.7		
6	2.4	0	23	10	10	1	10	2.5	6	16	0	3	0.5	0	6	1.2	5	0	7.5	2.5	10	0	0	20	0	136.6	114.4		
7	2.4	0	23	10	10	1	0	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	0	20	0	121.6	98.9		
8	2.4	0	23	10	10	1	10	2.5	6	16	0	3	0.5	0	6	1.2	5	0	7.5	2.5	10	0	0	20	0	136.6	107.8		
9**	2.4	0	11.5	10	5	1	0	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	0	20	0	105.1	80.5		
10	2.4	1.5	11.5	10	5	1	10	2.5	6	16	0	3	0.5	0	6	1.2	5	0	7.5	2.5	10	0	50	20	0	171.6	127.7		
11	2.4	0	11.5	10	5	1	0	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	0	10	0	95.1	68.7		
12	2.4	0	11.5	10	5	1	10	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	0	10	0	105.1	73.7		
13	2.4	0	11.5	10	5	1	0	2.5	6	16	0	3	0.5	0	6	1.2	5	0	7.5	2.5	10	0	0	10	0	100.1	68.2		
14	2.4	0	11.5	10	5	1	10	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	0	10	0	105.1	69.5		
15	2.4	0	11.5	10	5	1	0	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	50	10	0	145.1	93.1		
16	2.4	0	11.5	10	5	1	10	2.5	6	16	0	3	0.5	0	6	1.2	5	0	7.5	2.5	10	0	0	10	0	110.1	68.6		
17	2.4	0	11.5	10	5	1	0	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	0	10	0	95.1	57.5		
18	2.4	0	11.5	10	5	1	10	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	0	10	0	105.1	61.7		
19	2.4	0	11.5	10	5	1	0	2.5	6	16	0	3	0.5	0	6	1.2	0	0	7.5	2.5	10	0	0	10	0	95.1	54.2		
20	2.4	1.5	11.5	10	5	1	10	2.5	6	16	0	3	0.5	19	6	1.2	5	28	7.5	2.5	10	8	50	10	0	216.6	119.9		
																							TOTAL S			2696.2	2042.1		

NOTE: Most costs were as expected, except EPA oversight costs for FY '97-'98 were \$40k instead of \$20k, and for FY '98-'99 they are estimated at \$30k instead of \$20k.



Photograph #1

June 30, 1999

Location: Pickettville Road Landfill Site, Jacksonville, Duval County, Jacksonville, Florida.

Description: View looking north, from concrete block area in northeast corner of the PRLS. Realco Landfill and Pickettville Road in background, site entrance on left, Pond #1 on right, Ditch #1 and gas vent in foreground.



Photograph #2

June 30, 1999

Location: Pickettville Road Landfill Site, Jacksonville, Duval County, Jacksonville, Florida.

Description: View looking northeast toward Pond #1. Northeast boundary and site entrance culvert in background, Drainage Ditch #1 on right, gas vents and monitoring probe on left, adjacent to northern boundary.

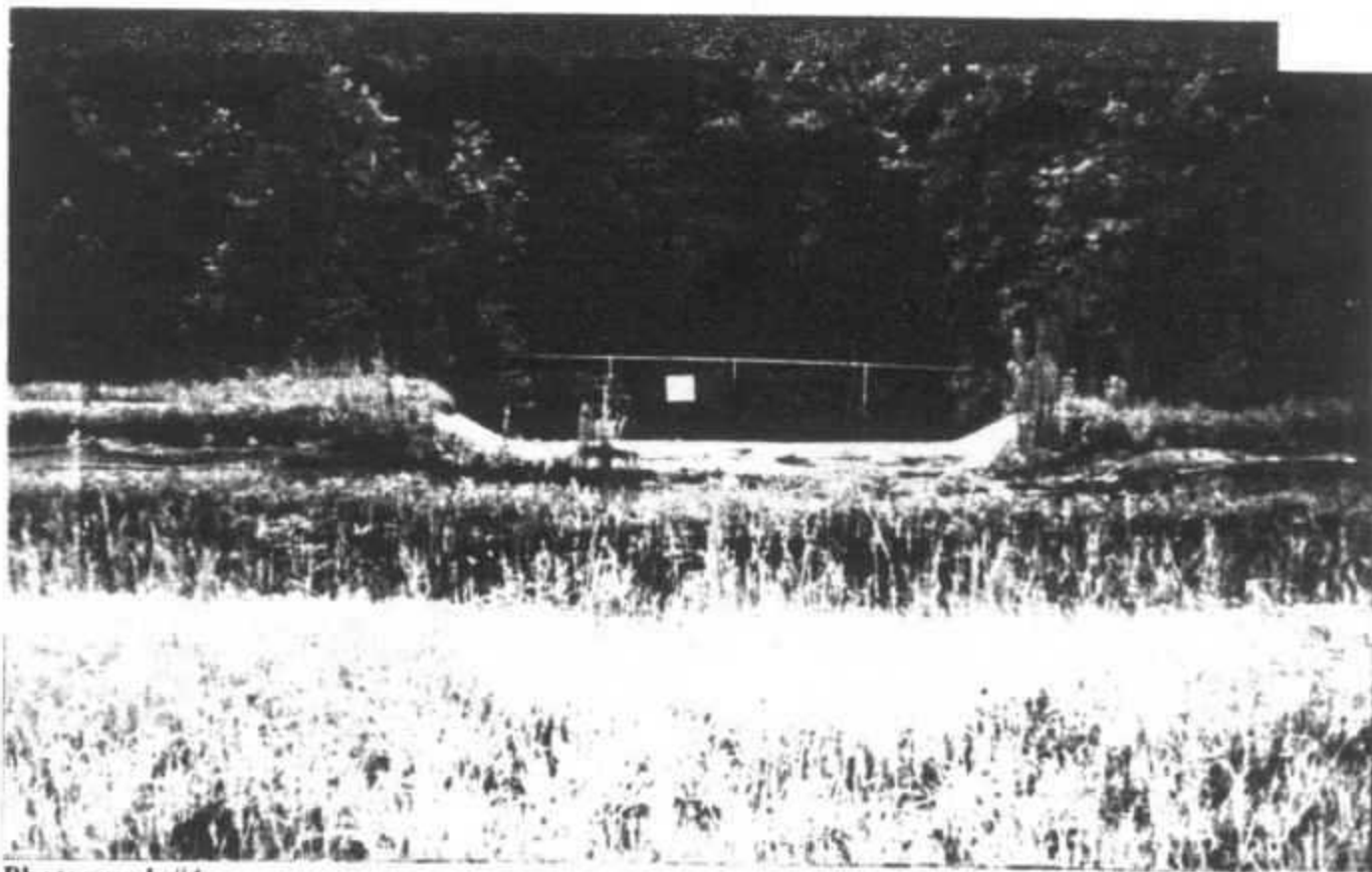


Photograph #3

June 30, 1999

Location: Pickettville Road Landfill Site, Jacksonville, Duval County, Jacksonville, Florida.

Description: View looking northeast at Pond #1, from concrete block area in northeast corner of the PRLS.



Photograph #4

June 30, 1999

Location: Pickettville Road Landfill Site, Jacksonville, Duval County, Jacksonville, Florida.

Description: View looking east toward Pond #2 and concrete spillway which discharges to Little Sixmile Creek during high water conditions.



Photograph #5

June 30, 1999

Location: Pickettville Road Landfill Site, Jacksonville, Duval County, Jacksonville, Florida

Description: View looking north at northern edge of Pond #2. Note the above water portion of a 24 inch drain pipe which discharges to Little Sixmile Creek. Note exposed band of filter fabric on right.



Photograph #6

June 30, 1999

Location: Pickettville Road Landfill Site, Jacksonville, Duval County, Jacksonville, Florida

Description: View looking south at Pond #2 from the northern edge of the pond.



Photograph #7

June 30, 1999

Location: Pickettville Road Landfill Site, Jacksonville, Duval County, Jacksonville, Florida.

Description: View looking northwest toward center of landfill from Pond #2. Note the two rows of silt fencing which control erosion.

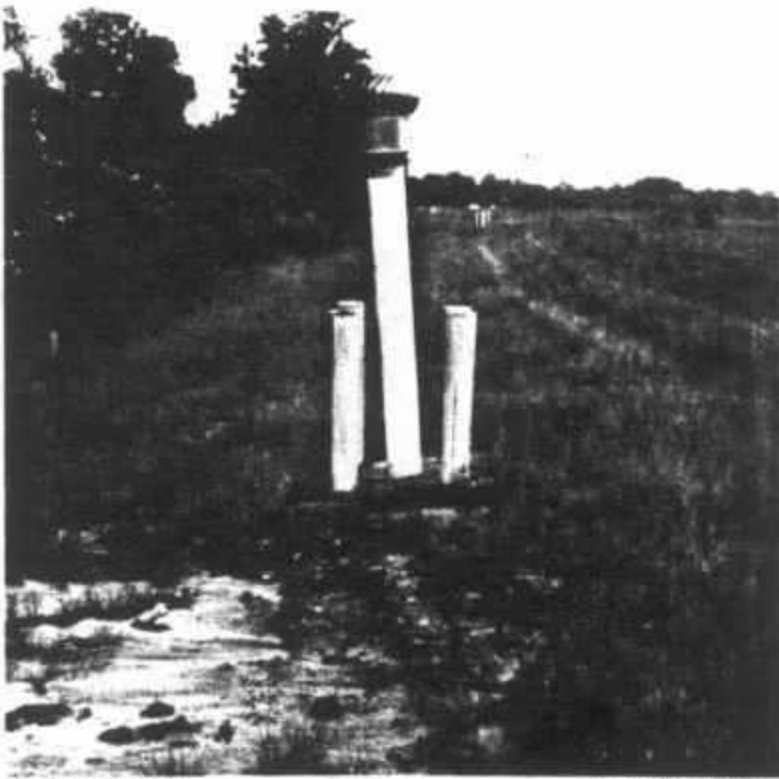


Photograph #8

June 30, 1999

Location: Pickettville Road Landfill Site, Jacksonville, Duval County, Jacksonville, Florida.

Description: Collapsed silt fence in an area of localized erosion and ponding of water.

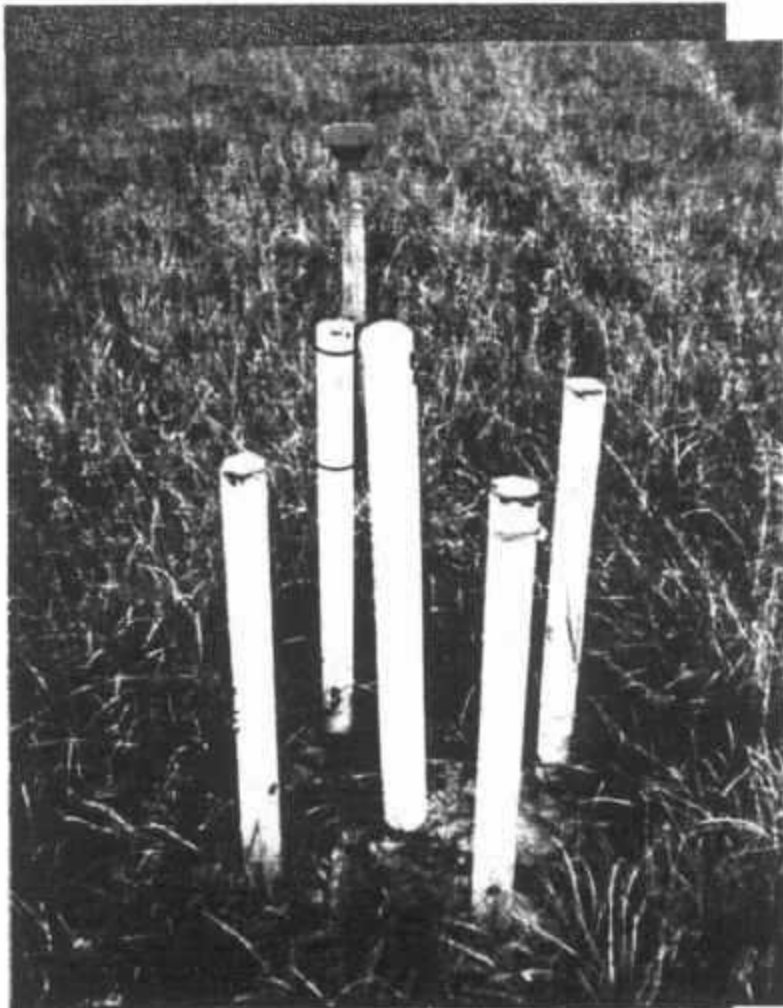


Photograph #9

June 30, 1999

Location: Pickettville Road Landfill Site, Jacksonville, Duval County, Jacksonville, Florida.

Description: Land fill gas vent. Several gas vents are leaning somewhat from vertical, such as the one shown here.



Photograph #10

June 30, 1999

Location: Pickettville Road Landfill Site, Jacksonville, Duval County, Jacksonville, Florida.

Description: Typical gas monitoring probe and rain gauge. Gas monitoring probes are located on either side of the gas collection trench.



Photograph #11

June 30, 1999

Location: Pickettville Road Landfill Site, Jacksonville, Duval County, Jacksonville, Florida.

Description: Typical secured monitoring well. Note the 55 gallon drum containing purge water from sampling activities taking place during the site visit.